

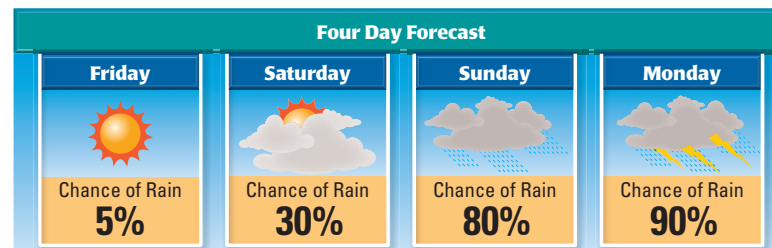
EXAMPLES

4 and 5

on p. 709
for Exs. 44–46

44. ★ **MULTIPLE CHOICE** Refer to the chart below. Which of the following probabilities is greatest? **D**

- (A) $P(\text{rains on Sunday})$ (B) $P(\text{does not rain on Saturday})$
(C) $P(\text{rains on Monday})$ (D) $P(\text{does not rain on Friday})$



45. **DRAMA CLUB** The organizer of a cast party for a drama club asks each of 6 cast members to bring one food item from a list of 10 items. What is the probability that at least 2 of the 6 cast members bring the same item? **0.8488**
46. **HOME ELECTRONICS** A development has 6 houses with the same model of garage door opener. Each opener has 4096 possible transmitter codes. What is the probability that at least 2 of the 6 houses have the same code? **about 0.00366**
- B** 47. ★ **EXTENDED RESPONSE** Use the given information about a farmer's tomato crop to complete parts (a)–(c).
- 40% of the tomatoes are partially rotten, 30% of the tomatoes have been fed on by insects, and 12% are partially rotten *and* have been fed on by insects. What is the probability that a randomly selected tomato is partially rotten *or* has been fed on by insects? **58%**
 - 20% of the tomatoes have bite marks from a chipmunk and 7% have bite marks *and* are partially rotten. What is the probability that a randomly selected tomato has bite marks *or* is partially rotten? **53%**
 - Suppose the farmer finds out that 6% of the tomatoes have bite marks *and* have been fed on by insects. Do you have enough information to determine the probability that a randomly selected tomato has been fed on by insects *or* is partially rotten *or* has bite marks from a chipmunk? If not, what other information do you require?
No; what percent of the tomatoes have bite marks.
48. **MULTI-STEP PROBLEM** Follow the steps below to explore a famous probability problem called the *birthday problem*. (Assume that there are 365 possible birthdays.)
- Calculate** Suppose that 6 people are chosen at random. Find the probability that at least 2 of the people share the same birthday. **about 0.04**
 - Calculate** Suppose that 10 people are chosen at random. Find the probability that at least 2 of the people share the same birthday. **about 0.12**
 - Model** Generalize the results from parts (a) and (b) by writing a formula for the probability $P(x)$ that at least 2 people in a group of x people share the same birthday. (Hint: Use ${}_nP_r$ notation in your formula.) **$P(x) = 1 - \frac{{}_{365}P_x}{365^x}$**
 - Analyze** Enter the formula from part (c) into a graphing calculator. Use the *table* feature to make a table of values. For what group size does the probability that at least 2 people share the same birthday first exceed 50%?
23 people

X	Y1
1	0
2	.00274
3	.0082
4	.01636
5	.02714

Y1=0

○ = **WORKED-OUT SOLUTIONS**
on p. WS1

★ = **STANDARDIZED**
TEST PRACTICE

49. **PET STORE** A pet store has 8 black Labrador retriever puppies (5 females and 3 males) and 12 yellow Labrador retriever puppies (4 females and 8 males). You randomly choose one of the Labrador retriever puppies. What is the probability that it is a female or a yellow Labrador retriever? $\frac{17}{20}$

- C** 50. **CHALLENGE** You own 50 DVDs consisting of 25 comedies, 15 dramas, and 10 thrillers. You randomly pick 4 movies to watch during a long train ride. What is the probability that you pick at least one DVD of each type of movie? **about 0.03**

MIXED REVIEW

Use the given values to write an equation relating x and y . Then find the value of y when $x = 8$.

52. $y = -\frac{x}{6}; -1\frac{1}{3}$

51. x, y vary directly; $x = -5, y = 20$ (p. 107)

52. x, y vary directly; $x = 54, y = -9$ (p. 107)

53. x, y vary inversely; $x = 12, y = -4$ (p. 551)

54. x, y vary inversely; $x = -2, y = -3$ (p. 551)

Find the inverse of the function. (p. 437)

55. $f(x) = 3x - 7$ $y = \frac{x+7}{3}$

56. $f(x) = -5x + 3$ $y = \frac{3-x}{5}$

57. $f(x) = -6x^2, x \leq 0$ $y = \sqrt{-\frac{x}{6}}$

59. $y = \frac{\sqrt{x+12}}{2}$

58. $f(x) = -2.5x^5$ $y = \sqrt[5]{\frac{x}{-2.5}}$

59. $f(x) = 4x^2 - 12, x \geq 0$

60. $f(x) = 0.2x^3 + 0.5$ $y = \sqrt[3]{\frac{x-0.5}{0.2}}$

Each event can occur in the given number of ways. Find the number of ways all of the events can occur. (p. 682)

61. Event A: 2 ways, Event B: 4 ways **8 ways**

62. Event A: 13 ways, Event B: 7 ways **91 ways**

63. Event A: 3 ways, Event B: 5 ways,
Event C: 6 ways **90 ways**

64. Event A: 12 ways, Event B: 11 ways,
Event C: 8 ways, Event D: 10 ways
10,560 ways

PREVIEW

Prepare for
Lesson 10.5
in Exs. 61–64.

QUIZ for Lessons 10.3–10.4

A card is randomly drawn from a standard deck of 52 cards. Find the probability of drawing the given card. (p. 698)

1. The queen of hearts $\frac{1}{52}$

2. An ace $\frac{1}{13}$

3. A diamond $\frac{1}{4}$

4. A red card $\frac{1}{2}$

5. A card other than a 10 $\frac{12}{13}$

6. The 6 of clubs $\frac{1}{52}$

You randomly select a marble from a bag. The bag contains 8 black, 13 red, 7 white, and 12 blue marbles. Find the indicated odds. (p. 698)

7. In favor of choosing blue $\frac{3}{7}$

8. In favor of choosing black or white $\frac{3}{5}$

9. Against choosing red $\frac{27}{13}$

10. Against choosing red or white $\frac{1}{1}$

Find the indicated probability. (p. 707)

11. $P(A) = 0.6$

12. $P(A) = \frac{?}{?}$

13. $P(A) = 0.75$

14. $P(A) = 8\%$

$P(B) = 0.35$

$P(B) = 0.44$

$P(B) = \frac{?}{?}$

$P(B) = 33\%$

$P(A \text{ or } B) = \frac{?}{?}$

$P(A \text{ or } B) = 0.56$

$P(A \text{ or } B) = 0.83$

$P(A \text{ or } B) = 41\%$

$P(A \text{ and } B) = 0.2$

$P(A \text{ and } B) = 0.12$

$P(A \text{ and } B) = 0.25$

$P(A \text{ and } B) = \frac{?}{?}$

0.75

0.24

0.33

0%

15. **COMPUTERS** A manufacturer of computer chips finds that 1% of the chips produced are defective. What is the probability that out of 8 chips, at least 2 are defective? (p. 707) **about 0.00269**

EXTRA PRACTICE for Lesson 10.4, p. 1019



ONLINE QUIZ at classzone.com

713

5 ASSESS AND RETEACH

Daily Homework Quiz

Transparency Available

- A card is randomly selected from a standard deck of 52 cards. What is the probability that it is a queen or an ace? $\frac{2}{13}$
- Of 200 students at a school, 58 play football, 40 play basketball, and 93 play both. What is the probability that a randomly selected student plays both? **0.025**
- When 2 six-sided dice are rolled, what is the probability that the sum is neither 2 nor 12? $\frac{17}{18}$
- A committee of 3 students is chosen from a group of 4 seniors and 6 juniors. What is the probability that the committee will have at least 1 senior? $\frac{5}{6}$



Online Quiz

Available at **classzone.com**

Diagnosis/Remediation

- Practice A, B, C in Chapter 10 Resource Book, pp. 41–43
- Study Guide in Chapter 10 Resource Book, pp. 44–45
- Practice Workbook, pp. 155–156
- @HomeTutor

Challenge

Additional challenge is available in the Chapter 10 Resource Book, p. 48.

Quiz

An easily-readable reduced copy of the quiz (with answers) on Lessons 10.3–10.4 from the Assessment Book can be found on p. 680E.